

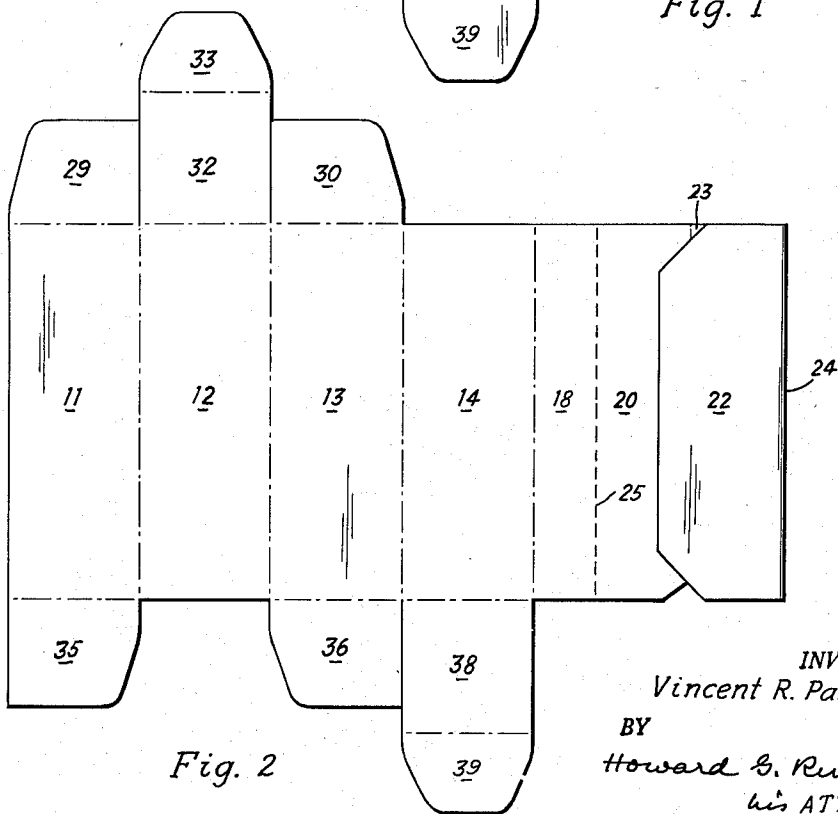
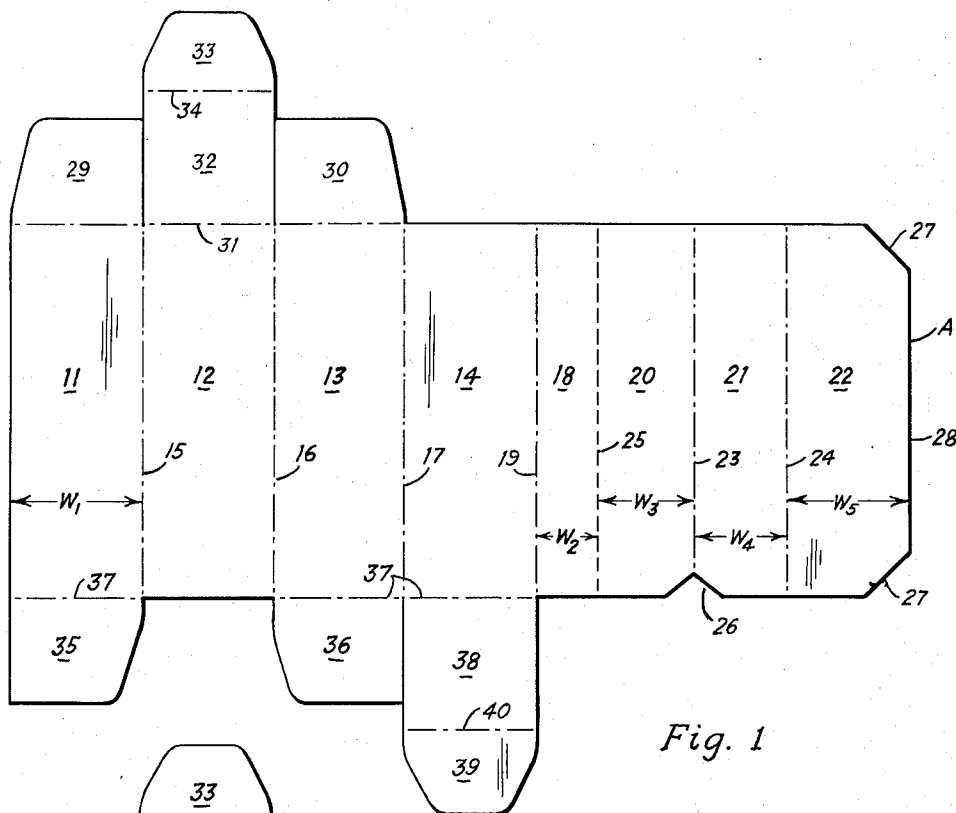
Jan. 31, 1956

V. R. PANTALONE
RADIO TUBE CARTONS

2,732,996

Filed Oct. 16, 1952

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

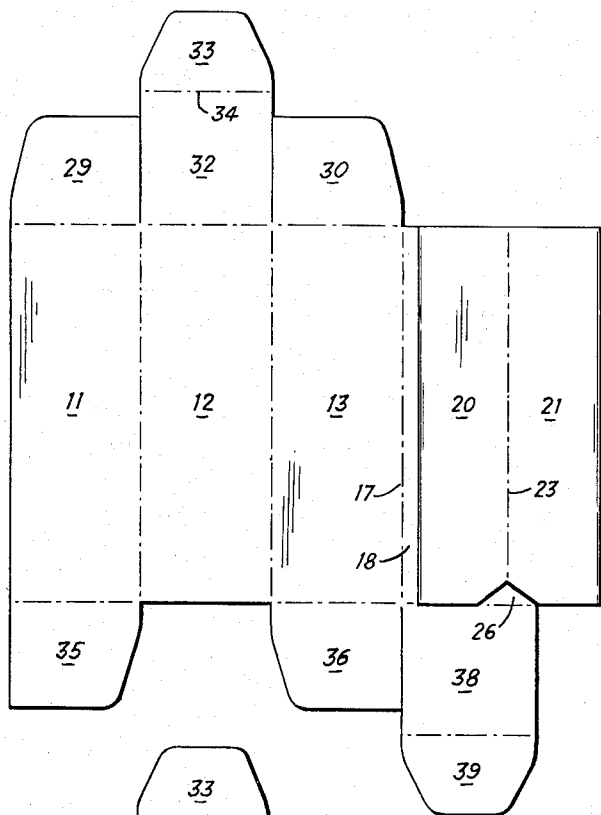


Fig. 3

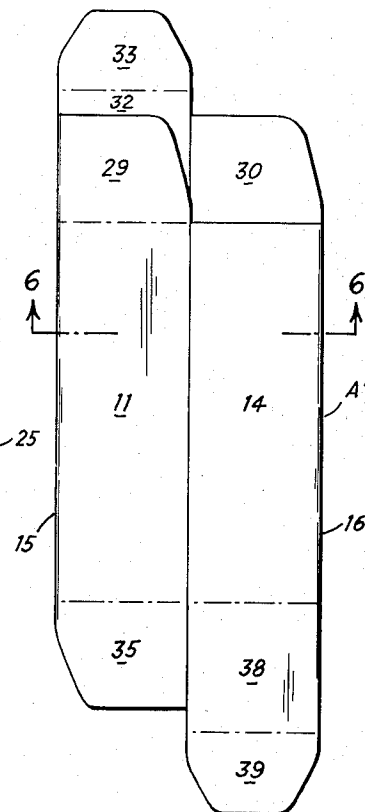


Fig. 5

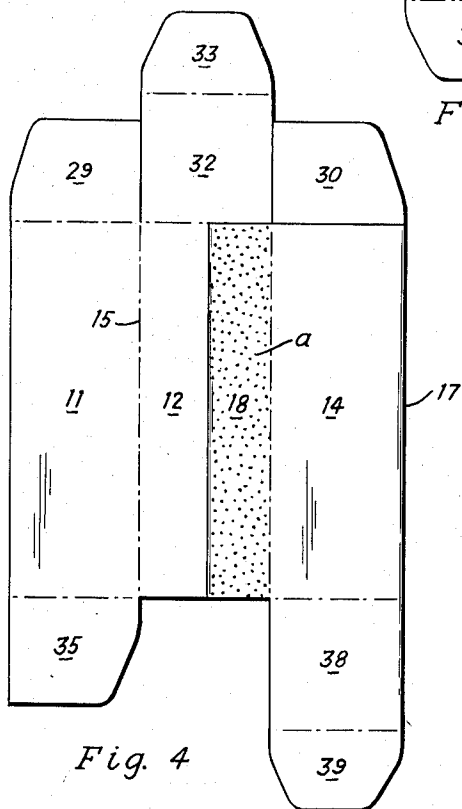


Fig. 4

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3 Sheets-Sheet 3

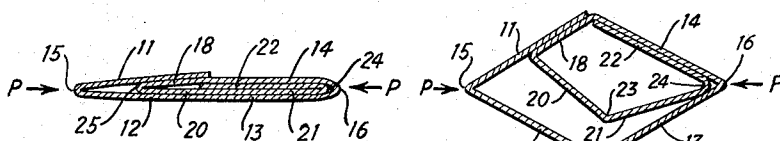


Fig. 6

Fig. 7

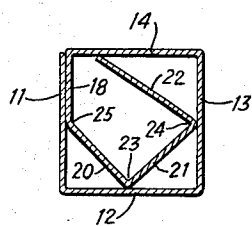


Fig. 8

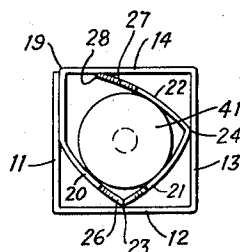


Fig. 9

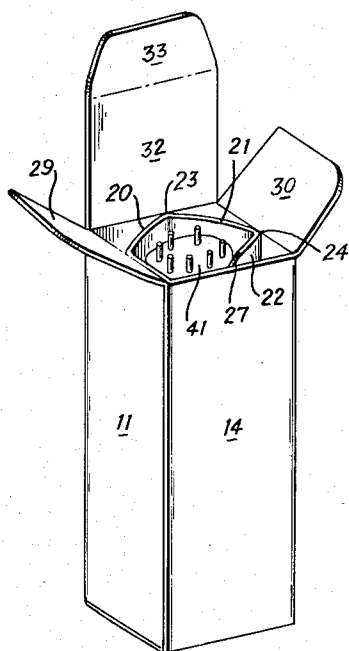


Fig. 10

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RADIO TUBE CARTONS

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Application October 16, 1952, Serial No. 315,138

2 Claims. (Cl. 229—39)

This invention relates to improvements in radio tube cartons.

The invention provides an improved radio tube carton which holds a tube securely within the carton without rattling and which supports the tube in a position in which the tube is spaced from the outer walls of the carton, thus protecting the tube against damage.

Experience has shown that prevention of rattling and prevention of contact of the tube with the outer walls of the carton are the two most important requirements for a radio tube carton.

The invention provides such a carton which, in addition to the aforementioned packaging features, is extremely simple to manufacture from a single blank of stock, can be produced on conventional folding and gluing machines, is simple to set up from a flat blank and is easy to fill and close.

These and various other features, objects and advantages of the invention will appear more fully from the detailed description which follows, accompanied by drawings showing, for the purpose of illustration, a preferred embodiment of the invention. The invention also resides in certain novel and original features of construction hereinafter set forth and claimed.

Although the characteristic features of the invention which are believed to be novel will be particularly pointed out in the claims appended hereto, the invention itself, its objects and advantages, and the manner in which it may be carried out, may be better understood by referring to the following description taken in connection with the accompanying drawings forming a part of it in which:

Fig. 1 is a plan view of a flat blank embodying the present invention, the inside surface of the blank facing the observer;

Fig. 2 is a plan view of the blank of Fig. 1 after a first folding operation;

Fig. 3 is a plan view of the blank of Fig. 1 after a second folding operation;

Fig. 4 is a plan view of the blank of Fig. 1 after a third folding operation and application of adhesive;

Fig. 5 is a plan view of the blank of Fig. 1 after a fourth folding operation, resulting in a flat collapsed tubular blank ready for expansion into hollow carton form;

Fig. 6 is a section taken on line 6—6 of Fig. 5;

Fig. 7 is a similar sectional view of the tubular blank in the process of squaring into hollow carton form;

Fig. 8 is a sectional view of the fully squared carton;

Fig. 9 is an end view of the carton with a tube inserted; and

Fig. 10 is a perspective view of the carton with a tube in it, prior to closing of the carton top end.

In the following description and in the claims, various details will be identified by the specific names for convenience. The names, however, are intended to be as generic in their application as the art will permit. Corresponding reference characters refer to corresponding parts in the several figures of the drawings.

In the drawings accompanying, and forming part of, this specification, certain specific disclosure of the invention is made for the purpose of explanation of broader aspects of the invention, but it is understood that the

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details may be modified in various respects without departure from the principles of the invention, and that the invention may be incorporated in other structures than the one shown.

The blank A shown in Fig. 1 may be cut and scored in multiple from sheets or rolls of suitable sheet material, for example paperboard, on conventional cutting and creasing machines. Only one side of the board need be imprinted or decoratively finished, since only one side of the board appears as the outside of the finished carton.

The blank A comprises four outer wall panels 11, 12, 13 and 14 articulated to one another along fold lines 15, 16 and 17. The outer wall panels are of substantially equal width as indicated at w_1 .

A securing panel 18 is articulated to the fourth outer wall panel 14 along a fold line 19. The securing panel is preferably of a width of the order of one half of the width of the outer wall panels, width of the securing panel being indicated at w_2 .

Three inner wall panels 20, 21 and 22 are articulated to one another along fold lines 23 and 24, respectively. The inner wall panel 20 is articulated to the securing panel 18 along a fold line 25. This fold line is preferably cut scored or otherwise weakened so that the blank offers less resistance to folding at this line than at the other fold lines.

The fold line 23 may also be weakened, but to a lesser degree. This is accomplished in the illustrated embodiment by notching out a portion of the board at 26, thereby shortening the length of the fold line 23. At the same time notching out of the board facilitates closing of the carton ends, as will later be seen.

The inner wall panels 20 and 21 are of substantially equal width, wider than the securing panel 18, but narrower than the outer wall panels 11, 12, 13 and 14. The width of the panel 20 is indicated at w_3 and may be slightly less than the width of the inner wall panel 21, the difference in width between the two panels may be of the order of $\frac{1}{16}$ of an inch.

The third inner end wall panel 22 is wider than the other inner end wall panels 20 and 21, but narrower than the outer end wall panels. Thus, w_5 is greater than w_3 or w_4 but less than w_1 .

The third inner end wall panel may be cut away at 27 to permit the board to flex more readily near its outer edge 28 than near its fold line 24. The purpose of this arrangement will later become apparent.

The end closures of cartons embodying the present invention may assume any one of various conventional forms. In the illustrated embodiment they are of the so called "reverse tuck" style. Inner end panels 29 and 30 are articulated to the outer end wall panels 11 and 13 along a fold line 31 extending at right angles to the lines of articulation between the several wall panels. An outer end panel 32 is articulated to the outer wall panel 12 along the fold line 31 and a tuck flap 33 extends from the outer end panel 32 along a fold line 34.

Similarly, inner end panels 35 and 36 extend from the outer wall panels 11 and 13, respectively, along fold lines 37, and an outer end panel 38 is hinged to the outer wall panel 14 along the fold line 37 and has a tuck flap 39 articulated to it along a fold line 40.

The blank A of Fig. 1 may be assembled into carton form as follows:

The blank A is first folded along the fold line 24 to bring the inner wall panel 22 face-to-face with the inner wall panels 20 and 21. This operation is illustrated in Fig. 2.

Next, the blank is folded along the fold line 25 to bring the folded panel 22 face-to-face with the inner surface of the securing panel 18 and with the fourth outer end wall panel 14. Thus, a so-called compound fold is pro-

duced. After completion of the compound fold the blank has the appearance as shown in Fig. 3.

Thereafter, adhesive *a* is applied to the outer surface of the securing panel 18 and the blank is folded along the fold line 17, to bring the previously completed compound fold over the remainder of the blank, principally over the outer wall panels 13 and 12, as shown in Fig. 4. Substantially simultaneously, or shortly thereafter, the blank is folded along the fold line 15 to bring the marginal portion of the outer wall panel 11 into adhesive engagement with the securing panel 18.

This completes the folding operations on the blank and the result is a flat, collapsed tubular structure A' illustrated in Fig. 5.

The tubular blank A' may be shipped and stored in collapsed flat condition and may readily be squared into hollow carton form for insertion of a tube and closing.

Fig. 6 illustrates the position which the various panels assume in the collapsed structure, and it will now be shown how the collapsed structure assumes hollow-box form by a simple application of pressure against the edges 15 and 16 in the direction of the arrows P.

When cartons are needed, the operator simply squeezes the flat collapsed carton blank A' as indicated by the arrows P, thus causing the carton panels to assume the position illustrated in Figs. 7 and 8.

The stiffness of the board along the unweakened fold line 24 assists in the squaring of the inner carton structure and causes the fold line 24 to slide along the inner surface of the outer side wall panel 13 until the third inner wall panel 22 assumes a position oblique with respect to the outer wall panels 12 and 13. The fold line 23 comes to rest at about the center of the outer wall panel 12 and the inner wall panels 21 and 20 assume an oblique position with regard to the outer end wall panels 12 and 11. Since the fold line 25 does not aid materially in the squaring of the inner wall panels, but merely serves as a hinge line, the stiffness of the board along this line may be relatively low. This reduces the tendency of the collapsed flat blank A' to open up from its flat condition prior to the application of pressure against its edges 15 and 16.

The fully squared carton, closed at one end, is shown in Fig. 10. A radio tube may readily be inserted between the inner wall panels 20, 21 and 22 which constitute an inner shell. The radio tube is indicated at 41. It forces the panels 20, 21 and 22 of the inner shell into a substantially square position. The inner panels 20, 21 and 22 are bowed slightly outwardly as is readily apparent from Fig. 9. The bowed or flexed panels hold the tube firmly in place with frictional contact and prevent the tube from sliding towards the end closures.

It is easily apparent that the endmost portion of the third inner wall panel 22, adjacent its outer edge 28, is flexed to a greater extent than the remainder of the panel 22. This is due to the cutting away of the portion 27, weakening the panels' resistance to flexing near the edge 28. The flexed panel 22, particularly its marginal portion along the edge 28 hugs the contour of the tube 41 and keeps it from sliding towards the upper left hand corner, particularly towards the fold line 19. The bowing of the panel 22 makes a fourth inner wall panel unnecessary and also gives the carton a variable capacity as to the size of tube that may be packaged therein.

Thus, a radio tube carton having both an outer shell and an inner shell is constructed from a single blank. The inner shell has an oblique or skewed relation with regard to the outer shell when the carton blank is squared and filled. A tube supported within the inner shell is positively spaced from the outer carton walls and is protected against damage by forces acting on the outer carton walls. The cushioning effect of the tube suspension is great and protects the tube effectively against breakage even in instances where the carton is dropped. The frictional engagement between the tube and the

inner shell is sufficient to prevent lengthwise shifting of the tube towards the ends of the carton. Tubes of different diameter may be packaged in the same carton due to the construction of the inner walls permitting various degrees of flexing to accommodate larger, or smaller tubes.

The carton may be readily assembled on conventional folding and gluing machine of the straight line type. A particular feature of the illustrated construction is that the inner shell automatically assumes its oblique position with regard to the outer shell when the outer shell is squared.

Aside from the weakening of the fold line 23 by the cut 26 and weakening of the panels 22 against flexing by the cut 27, these cuts permit easy insertion of the tuck flaps 39 and 33 respectively, by providing relief at that portion of the inner shell at which the tuck flaps enter when the ends of the carton are being closed.

What is claimed is:

1. A one-piece collapsible radio tube carton comprising panels articulated to one another along side fold lines in this order: four outer wall panels of substantially equal width; a glue panel narrower than said outer wall panels, said glue panel being articulated to the fourth outer wall panel and adhered to the first outer wall panel; an end panel articulated to one end of the fourth outer wall panel; a tuck flap articulated to said end panel; and at least three inner wall panels of which each of the first two are wider than the glue panel, but narrower than the outer wall panels, the third inner panel being wider than each of the first two inner wall panels, the width being sufficiently great to cause the third inner wall panel to converge towards, rather than diverge from, the first inner panel, when, in the fully squared carton the end edge of the third panel rests against the inner surface of the fourth outer panel at a line of contact which lies closer to the line of articulation between the glue panel and the fourth outer panel than one-half the width of the fourth outer panel, the first and second inner wall panels being notched out by removal of a substantially V-shaped piece of stock from the edge of said panels at the line of articulation between the first and second inner wall panels, which line rests against the second outer wall panel in the assembled carton.

2. A pre-glued flat collapsible radio tube carton comprising, four outer wall panels of substantially equal width articulated to one another along side fold lines; a glue panel articulated to the fourth outer wall panel and adhered to the first outer wall panel; three inner wall panels articulated to one another, and to the glue panel, respectively, the third inner wall panel being wider than the first and the second inner wall panels, taken singly; in collapsed condition the first and the second outer wall panels being folded back to back, the second and third outer wall panels being folded back to back, the second and third inner wall panels being folded back upon each other and lying between a third and fourth outer wall panel with the fold line between the second and third inner wall panels lying immediately adjacent and inside the fold line between the third and fourth outer wall panels, and the glue panel and the first inner wall panel being folded back to back, the first inner wall panel lying face-to-back with the second and third outer wall panel, the end edge of the third inner panel extending to, and terminating substantially at, the fold line between the fourth outer wall panel and the glue panel.

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